locating juveniles in forest habitat, and delayed prey delivery encouraged juvenile flight. Shortly after fledging, juvenile eagles began to attempt hunting. However, juveniles remained dependent on their parents until early winter when, as they became increasingly independent, each left the area of its own accord. **Ikeda, Yoshihide. 1985. M.S. Thesis, Kanazawa Univ., Japan. 302 pp. (In Japanese). Present address: Division of Life Sciences, Graduate School of Natural Science & Technology, Kanazawa University, Marunouchi 1-1, Kanazawa 920, Japan.**

J. Raptor Res. 21(2):80

ASPECTS OF THE ECOLOGY, FOOD HABITS AND FORAGING CHARACTERISTICS OF GYRFALCONS IN THE CENTRAL CANADIAN ARCTIC

A population of breeding Gyrfalcons (*Falco rusticolus*), studied from 1982–1986 on a 2000 km^2 study area in the central arctic of the Northwest Territories, occupied 14 to 18 territories each year. The mean internest distance was 10.6 km, giving a density that approaches the highest recorded. There was a tendency for regularity in spacing of territories. Most (85%) nests were in abandoned stick nests of Ravens (*Corvus corax*) or Golden Eagles (*Aquila chrysaetos*) ($\bar{X}$ ± SD) of clutch was 3.80 ± 0.52, of brood was 2.53 ± 0.89, and mean productivity was 1.50 ± 1.43 fledged young. Reproductive success declined with increased severity of spring weather.

Three prey species, Rock Ptarmigan (*Lagopus mutus*), Arctic Ground Squirrel (*Spermophilus parryii*) and Arctic Hare (*Lepus arcticus*), accounted for 96.5% of the total prey biomass identified. Gyrfalcons responded functionally to the varying availability of prey. Ptarmigan and hares were taken in May and June of all years (98.2% biomass). About 1 July, when nestling Gyrfalcons were growing rapidly, juvenile ground squirrels emerged and vulnerability of ptarmigan appeared to decline. Squirrels were used extensively in July and August of 1984 and 1985, but in 1986 there was a nearly complete failure of squirrel production, and ptarmigan continued to be the dominant prey species throughout the summer. Spring counts suggested densities of breeding ptarmigan were relatively constant during the study. Mean weight of prey taken by male Gyrfalcons (250 g) was significantly less than prey captured by females (330 g) (*t*-Test; t = −1.81; P = 0.036). As predicated by optimal foraging theory, larger prey items, on average, were brought to the nest as foraging time away from the nest increased.

Brood size was manipulated at two Gyrfalcon nests in 1986. The parent birds responded to altered brood size by compensatory changes in total prey biomass fed to the nestlings, suggesting that food was not limiting brood size. Conditions of food abundance were also observed at nests of unmanipulated broods, indicating that food was not limiting during the nestling period. I suggest that spacing of pairs was set during courtship and prelaying when food was most likely to be limiting. Courtship and prelaying coincided with the yearly low in prey availability and a period when the male was doing most of the hunting for himself and the female. The observation that most pairs did not initiate laying until after the spring arrival of migrating ptarmigan is consistent with this conclusion. **Poole, K. G. 1987. M.Sc. Thesis, Dept. of Zoology, Univ. of Alberta, Edmonton, Alberta T6G 2E9, CANADA. 120 pp. Present address: Wildlife Management Division, N.W.T. Renewable Resources, Yellowknife, N.W.T. X1A 2L9, CANADA.**

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POST-FLEDGING BEHAVIOR OF THE EASTERN SCREECH-OWL (*Otus asio*)

Three families of Eastern Screech-Owls (*Otus asio*) (six adults and 10 juveniles) were radio-tagged and monitored during the post-fledging period in central Kentucky. Fledging dates ranged from 14–27 May 1985. Five hundred fifteen roost sites were located and quantified. Adult and juvenile Eastern Screech-Owls used open limbs (46.4%), tangles (31.9%), and conifers (21.7%) for roosting; tree cavities were not used during the study period. Twenty-eight species of trees and shrubs were used for roosting; Eastern redcedar (*Juniperus virginiana*) (26.8%) and shagbark hickory (*Carya ovata*) (18.3%) were selected most often. Families differed significantly in mean roost height, roost tree height, roost tree diameter, distance between daily roost sites, distance from nest, distance from male, and the distance from female roost site. There were no significant differences among adults and juveniles for the above roost site variables. Mean distance between roost sites of juveniles and those of both adult males and adult females increased significantly after the fifth week post-fledging, possibly suggesting a time when juveniles are becoming independent of parents.

Height and diameter of roost tree, distance between daily roost sites, and distance from nest for juveniles differed significantly with age. Entire families roosted together on 37 occasions (22%).

Six juvenile owls occupied minimum area home ranges that averaged 33.4 ha in size (range, 12.3–60.4 ha). Four adult home ranges averaged 45.3 ha in size. Biweekly and cumulative home ranges of both adults and juveniles increased as post-fledging period progressed. Adult and juvenile home ranges did not differ significantly in size among families. Juvenile owls began to range more widely outside home ranges of their parents after about five weeks post-fledging, as evidenced by a smaller percentage of overlap in home ranges after this time.

Nine juvenile Eastern Screech-Owls remained on their natal territories for an average of 56 d (range, 45–65 d) after fledging. Dispersal dates ranged from 8–21 July 1985 ($\bar{x}$ = 14 July). Median straight-line dispersal distance was 1.8 km (range, 1.2–16.9 km). Median dispersal direction was 161 degrees (range, 141–306 degrees). There were no significant differences in dispersal distance or direction among families.

Juvenile mortality prior to dispersal was 10%. Five of six juveniles (83%) known to be alive following dispersal either starved or were killed by predators by March 1986. One juvenile male was known to have survived into the 1986 breeding season at which time it acquired a mate and nested. Four young hatched, but the nest was abandoned for unknown reasons. The young failed to fledge. **Belthoff, James R. 1987. M.Sc. Thesis, Department of Biological Sciences, Eastern Kentucky University, Richmond, KY 40475 U.S.A. Thesis Advisor: Gary Ritchison. Present address of author: Department of Biological Sciences, Clemson University, Clemson, SC 29634, U.S.A.**

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THE FEEDING, ROOSTING, AND PERCHING BEHAVIOR OF THE BALD EAGLES (*Haliaeetus leucocephalus*) OF MASON NECK, VIRGINIA WITH SPECIAL REFERENCE TO THE DEVELOPMENT OF MASON NECK STATE PARK

The feeding, roosting and perching behavior of Bald Eagles on Mason Neck, Virginia, were studied with special reference to effects from development of Mason Neck State Park. Observations were begun in January 1981 and continued into 1985.

Most eagle feeding activity was observed when wind speeds were <16 km/hr and temp was 18–26°C, although hunting success was not found to be dependent on wind speed, temp, or cloud cover. Eagles were observed to use four main hunting methods: 1) swooping from flight, 2) swooping from a tree perch, 3) wading from shore and grabbing with the beak or talons, and 4) gliding out from ice or a low perch on piles of ice. The last two methods were only used by adult eagles, but the frequency of use and success rates of methods one and two were independent of age. Few inter- and intraspecific interactions were seen in feeding areas, likely due to the fact that neither eagles nor their prey species were found in highly concentrated numbers. Observations of feeding and analysis of prey remains and pellets (N = 82) indicated that diet of the eagles was composed of 53.7% fish [mostly Brown Bullhead (*Ictalurus nebulosus*)], 9.8% mammals [mostly Eastern Cottontail (*Sylvilagus floridanus*)], 28% birds, 6.1% turtles and 2.5% crayfish.

Roost trees selected by eagles were typical in that they were fairly large with a strong, open branching structure, easily accessible, had good visibility and were close to water and feeding areas. Roost trees measured (N = 22) had a mean (±SD) diameter at breast height (DBH) of 54.4 cm (± 27.4), height of 18.9 m (± 5.5) and distance from water of 12.4 m (±17.7).

Weekly roost counts showed that the numbers of eagles using the roost peaked between September and April with only a few birds using the roost during summer. Annual peak counts of eagles using the roost ranged from nine to 20 with highest numbers occurring in November, December and January. Color band numbers identified some of the eagles as coming from specific localities; 24 from the Chesapeake Bay Region of Virginia and Maryland, two from Maine, two from New York, and one from South Carolina. Many interactions were seen between immature eagles, the majority age group in the roost. Incidents of potential human disturbance in the roost are discussed.

Perch trees were found to be similar to roost trees in dimensions, but their mean distance from water was less. Eagles perched in 36% of all sightings exclusive of the roost. Interactions of birds perched in feeding and breeding areas are described.

A certain amount of tolerance to human activity was shown by eagles on Mason Neck, but caution must be maintained to protect sensitive areas such as roost and nesting territory from adverse human disturbance. Recommendations are made to the state park to restrict human use near the roost site. **Haines, Susan L. 1986. M.Sc. Thesis, Biology Department, George Mason University, Fairfax, VA 22030, U.S.A. Present address: 107 Beaver Lodge Road, Stafford, VA 22554, U.S.A.**